

## **THE CLAIMS**

What is claimed is:

1           1.       A TiW-selective composition comprising water and between about 5% and  
2       about 20% by weight of periodic acid, wherein the composition is effective in removing a  
3       TiW alloy and removing residues of etching of TiW alloy while removing a relatively small  
4       amount of Al, Cu, or an AlCu alloy, and wherein the pH of the composition is less than 7.

1           2.       The composition of claim 1, wherein the composition is substantially free of  
2       hydrofluoric acid.

1           3.       The composition of claim 1, wherein the pH of the composition is less than  
2       about 4.

1           4.       The composition of claim 1, wherein the pH of the composition is less than  
2       about 2.

1           5.       The composition of claim 1, wherein the composition contains periodic acid in  
2       an amount from about 7.5% to about 15% by weight of the composition.

1           6.       The composition of claim 1, wherein the composition contains periodic acid in  
2       an amount from about 8% to about 12% by weight of the composition.

1           7.       The composition of claim 1, wherein the composition contains periodic acid in  
2       an amount of about 10 % by weight of the composition.

1           8.       A method of etching and cleaning a TiW alloy layer comprising:  
2               providing a substrate comprising an exposed TiW alloy layer;  
3               etching the TiW alloy by a method which results in formation of etching  
4       residue;

5                   contacting the substrate with the composition of claim 1 for a time and at a  
6                   temperature sufficient to cause the composition to remove at least a portion of the TiW alloy  
7                   and substantially all of the etching residue from the substrate; and  
8                   rinsing the substrate.

1                9.       The method of claim 8, wherein the substrate further comprises an exposed  
2                AlCu alloy, wherein the specificity of removal of TiW to AlCu, in terms of etch rate, is at  
3                least about 3.

1                10.     The method of claim 9, wherein the substrate further comprises an exposed  
2                AlCu alloy, wherein the specificity of removal of TiW to AlCu, in terms of etch rate, is at  
3                least about 5.

1                11.     The method of claim 10, wherein the substrate further comprises an exposed  
2                AlCu alloy, wherein the specificity of removal of TiW to AlCu, in terms of etch rate, is at  
3                least about 7.

1                12.     The method of claim 8, wherein the temperature at which the solution is used  
2                ranges from about 20°C to about 100°C.

1                13.     The method of claim 8, wherein the temperature at which the solution is used  
2                ranges from about 30°C to about 40°C.

1                14.     A method of etching and cleaning TiW layer comprising:  
2                    providing a substrate comprising a TiW alloy layer and etching residues from  
3                    prior etching of the TiW layer;  
4                    contacting the substrate with a solution containing hydrogen peroxide for a  
5                    time and at a temperature sufficient to cause the solution to substantially remove exposed  
6                    TiW alloy;

7                    contacting the substrate with the composition of claim 1 for a time and at a  
8                    temperature sufficient to substantially remove the residues from the substrate; and  
9                    rinsing the substrate.

1                    15.     The method of claim 14, wherein the temperature at which the solution is used  
2                    ranges from about 20°C to about 100°C.

1                    16.     The method of claim 15, wherein the temperature at which the solution is used  
2                    ranges from about 30°C to about 40°C.